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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,855	03/12/2004	Hisashi Amaya	12054-0024	6672
22902	7590	08/17/2007	EXAMINER	
CLARK & BRODY 1090 VERMONT AVENUE, NW SUITE 250 WASHINGTON, DC 20005			ROE, JESSEE RANDALL	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/798,855	Applicant(s) AMAYA ET AL.	
	Examiner Jessee Roe	Art Unit 1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status:

- 1) ☒ Responsive to communication(s) filed on 12 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 13-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 13-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of the Claims

Claims 1-8 and 13-20 are pending wherein claims 1-8 and 13-20 are amended.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12 June 2007 has been entered.

Status of Previous Rejections

The previous rejection of claims 1-2 under 35 U.S.C. 103(a) as being unpatentable over Lena (US 2,799,602) is withdrawn in view of the Applicant's arguments. The previous rejections of claims 3-8 under 35 U.S.C. 103(a) as being unpatentable over Yoshihiro et al. (JP 2001-152295) with evidence from the ASM Handbook Volume 4 is withdrawn in view of the Applicant's amendments to the claims. The previous rejection of claims 13-20 under 35 U.S.C. 103(a) as being unpatentable over Yoshihiro et al. (JP 2001-152295) with evidence from the ASM Handbook Volume 4 and Kushida et al. (US 6,379,621) is withdrawn in view of the Applicant's amendments to the claims. The previous rejection of claims 3-8 and 13-20 under 35 U.S.C. 103(a) as being unpatentable over Schumacher (US 5,089,067) with evidence from the ASM

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Handbook Volume 4 and Kushida et al. (US 6,379,821) is withdrawn in view of the Applicant's amendments to the claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoshino et al. (US 4,878,955).

In regards to claims 1-2, Hoshino et al. ('955) disclose a martensitic stainless steel, with a composition that compares with the composition of the instant invention, as shown in the table below (col. 2, lines 32-68).

Element	From Instant Claims (mass percent)	Hoshino et al. ('955) (mass percent)	Overlapping range
C	0.02 – 0.10	0 – 0.10	0.02 – 0.10
Si	0.05 – 1.0	0.85 – 4.5	0.85 – 1.0
Mn	0.05 – 0.95	0.20 – 5.0	0.05 – 0.95
P	0 – 0.03	0 – 0.06	0 – 0.03
S	0 – 0.01	0 – 0.03	0 – 0.01
Cr	9.0 – 15.0	10.0 – 17.0	10.0 – 15.0
Ni	0.1 – 4.5	3.0 – 8.0	3.0 – 4.5
Al	0 – 0.05	0 – 1.0	0 – 0.05
N	0 – 0.10	0 – 0.10	0 – 0.10
Cu	0.05 – 5.0	0 – 4.0	0.05 – 4.0
Mo	0.05 – 5.0	0 – 4.0	optional
Fe	balance	balance	balance

The Examiner notes that the amounts of carbon, silicon, manganese, phosphorus, sulfur, chromium, nickel, aluminum, nitrogen, copper, and molybdenum disclosed by Hoshino et al. ('955) overlap the composition of the instant invention, which is a prima facie case of obviousness. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed composition over the composition disclosed by Hoshino et al. ('955) because Hoshino et al. ('955) disclose the same utility throughout the disclosed ranges.

With respect to the martensitic stainless steel having "a plastically-processed history" in claims 1-2, Hoshino et al. ('955) disclose wherein the martensitic stainless steel would be cold rolled (col. 2, lines 32-68).

With respect to the limitation wherein the hardness would be 30-45 HRC in claims 1-2, Hoshino et al. ('955) disclose hardnesses that would be in the range of 30-45 HRC (Fig. 2).

With respect to the limitation that the amount of carbides in the grain boundaries of the prior austenite would not be more than 0.5 volume percent in claims 1-2, Hoshino et al. ('955) disclose an overlapping composition and a substantially similar treatment process (col. 6). Therefore, the amount of carbides in the grain boundaries of the prior austenite being not more than 0.5 volume percent would be expected. See MPEP 2112.01 I.

With respect to the formula $0.2 \leq \text{Mo} + \text{Cu}/4 \leq 5$ and $0.55 \leq \text{Mo} + \text{Cu}/4 \leq 5$ in claims 1-2, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, In re Cooper and Foley 1943

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C.D. 357, 553 O.G. 177; 57 USPQ 117, Taklatwalla v. Marburg, 620 O.G. 685, 1949 C.D. 77, and In re Pilling, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of copper and molybdenum from the ranges disclosed by Hoshino et al. ('955) such that the formula would be satisfied because Hoshino et al. ('955) teaches the same utility throughout the disclosed ranges.

In regards to claims 3-4, Hoshino et al. ('955) disclose a martensitic stainless steel, with a composition that compares with the composition of the instant invention, as shown in the table below (col. 2, lines 32-68).

Element	From Instant Claims (mass percent)	Hoshino et al. ('955) (mass percent)	Overlapping range
C	0.02 – 0.10	0 – 0.10	0.02 – 0.10
Si	0.05 – 1.0	0.85 – 4.5	0.85 – 1.0
Mn	0.05 – 0.95	0.20 – 5.0	0.05 – 0.95
P	0 – 0.03	0 – 0.06	0 – 0.03
S	0 – 0.01	0 – 0.03	0 – 0.01
Cr	9.0 – 15.0	10.0 – 17.0	10.0 – 15.0
Ni	0.1 – 4.5	3.0 – 8.0	3.0 – 4.5
Al	0 – 0.05	0 – 1.0	0 – 0.05
N	0 – 0.10	0 – 0.10	0 – 0.10
Cu	0.05 – 5.0	0 – 4.0	0.05 – 4.0
Mo	0.05 – 5.0	0 – 4.0	optional
Ti	0.005 – 0.5	0 – 1.0	0.005 – 0.5
V	0.005 – 0.5	0 – 1.0	0.005 – 0.5
Nb	0.005 – 0.5	0 – 1.0	0.005 – 0.5
Fe	balance	balance	balance

The Examiner notes that the amounts of carbon, silicon, manganese, phosphorus, sulfur, chromium, nickel, aluminum, nitrogen, copper, molybdenum,

titanium, vanadium, and niobium disclosed by Hoshino et al. ('955) overlap the composition of the instant invention, which is a prima facie case of obviousness. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed composition over the composition disclosed by Hoshino et al. ('955) because Hoshino et al. ('955) disclose the same utility throughout the disclosed ranges.

With respect to the martensitic stainless steel having "a plastically-processed history" in claims 3-4, Hoshino et al. ('955) disclose wherein the martensitic stainless steel would be cold rolled (col. 2, lines 32-68).

With respect to the limitation wherein the hardness would be 30-45 HRC in claims 3-4, Hoshino et al. ('955) disclose hardnesses that would be in the range of 30-45 HRC (Fig. 2).

With respect to the limitation that the amount of carbides in the grain boundaries of the prior austenite would not be more than 0.5 volume percent in claims 3-4, Hoshino et al. ('955) disclose an overlapping composition and a substantially similar treatment process (col. 6). Therefore, the amount of carbides in the grain boundaries of the prior austenite being not more than 0.5 volume percent would be expected. See MPEP 2112.01 I.

With respect to the formula $0.2 \leq \text{Mo} + \text{Cu}/4 \leq 5$ and $0.55 \leq \text{Mo} + \text{Cu}/4 \leq 5$ in claims 3-4, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, *In re Cooper and Foley* 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, *Taklatwalla v. Marburg*, 620 O.G. 685, 1949

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C.D. 77, and *In re Pilling*, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. *In re Austin, et al.*, 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of copper and molybdenum from the ranges disclosed by Hoshino et al. ('955) such that the formula would be satisfied because Hoshino et al. ('955) teaches the same utility throughout the disclosed ranges.

In regards to claims 5-6, Hoshino et al. ('955) disclose a martensitic stainless steel, with a composition that compares with the composition of the instant invention, as shown in the table below (col. 2, lines 32-68).

Element	From Instant Claims (mass percent)	Hoshino et al. ('955) (mass percent)	Overlapping range
C	0.02 – 0.10	0 – 0.10	0.02 – 0.10
Si	0.05 – 1.0	0.85 – 4.5	0.85 – 1.0
Mn	0.05 – 0.95	0.20 – 5.0	0.05 – 0.95
P	0 – 0.03	0 – 0.06	0 – 0.03
S	0 – 0.01	0 – 0.03	0 – 0.01
Cr	9.0 – 15.0	10.0 – 17.0	10.0 – 15.0
Ni	0.1 – 4.5	3.0 – 8.0	3.0 – 4.5
Al	0 – 0.05	0 – 1.0	0 – 0.05
N	0 – 0.10	0 – 0.10	0 – 0.10
Cu	0.05 – 5.0	0 – 4.0	0.05 – 4.0
Mo	0.05 – 5.0	0 – 4.0	optional
B	0.0002 – 0.005	0 – 1.0	0.0002 – 0.005
Fe	balance	balance	balance

The Examiner notes that the amounts of carbon, silicon, manganese, phosphorus, sulfur, chromium, nickel, aluminum, nitrogen, copper, molybdenum, and boron disclosed by Hoshino et al. ('955) overlap the composition of the instant invention, which is a prima facie case of obviousness. See MPEP 2144.05 I. It would have been

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obvious to one of ordinary skill in the art at the time the invention was made to select the claimed composition over the composition disclosed by Hoshino et al. ('955) because Hoshino et al. ('955) disclose the same utility throughout the disclosed ranges.

With respect to the martensitic stainless steel having "a plastically-processed history" in claims 5-6, Hoshino et al. ('955) disclose wherein the martensitic stainless steel would be cold rolled (col. 2, lines 32-68).

With respect to the limitation wherein the hardness would be 30-45 HRC in claims 5-6, Hoshino et al. ('955) disclose hardnesses that would be in the range of 30-45 HRC (Fig. 2).

With respect to the limitation that the amount of carbides in the grain boundaries of the prior austenite would not be more than 0.5 volume percent in claims 5-6, Hoshino et al. ('955) disclose an overlapping composition and a substantially similar treatment process (col. 6). Therefore, the amount of carbides in the grain boundaries of the prior austenite being not more than 0.5 volume percent would be expected. See MPEP 2112.01 I.

With respect to the formula $0.2 \leq \text{Mo} + \text{Cu}/4 \leq 5$ and $0.55 \leq \text{Mo} + \text{Cu}/4 \leq 5$ in claims 5-6, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, *In re Cooper and Foley* 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, *Taklatwalla v. Marburg*, 620 O.G. 685, 1949 C.D. 77, and *In re Pilling*, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. *In re*

Austin, et al., 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of copper and molybdenum from the ranges disclosed by Hoshino et al. ('955) such that the formula would be satisfied because Hoshino et al. ('955) teaches the same utility throughout the disclosed ranges.

In regards to claims 7-8, Hoshino et al. ('955) disclose a martensitic stainless steel, with a composition that compares with the composition of the instant invention, as shown in the table below (col. 2, lines 32-68).

Element	From Instant Claims (mass percent)	Hoshino et al. ('955) (mass percent)	Overlapping range
C	0.02 – 0.10	0 – 0.10	0.02 – 0.10
Si	0.05 – 1.0	0.85 – 4.5	0.85 – 1.0
Mn	0.05 – 0.95	0.20 – 5.0	0.05 – 0.95
P	0 – 0.03	0 – 0.06	0 – 0.03
S	0 – 0.01	0 – 0.03	0 – 0.01
Cr	9.0 – 15.0	10.0 – 17.0	10.0 – 15.0
Ni	0.1 – 4.5	3.0 – 8.0	3.0 – 4.5
Al	0 – 0.05	0 – 1.0	0 – 0.05
N	0 – 0.10	0 – 0.10	0 – 0.10
Cu	0.05 – 5.0	0 – 4.0	0.05 – 4.0
Mo	0.05 – 5.0	0 – 4.0	optional
Ti	0.005 – 0.5	0 – 1.0	0.005 – 0.5
V	0.005 – 0.5	0 – 1.0	0.005 – 0.5
Nb	0.005 – 0.5	0 – 1.0	0.005 – 0.5
B	0.0002 – 0.005	0 – 1.0	0.0002 – 0.005
Fe	balance	balance	balance

The Examiner notes that the amounts of carbon, silicon, manganese, phosphorus, sulfur, chromium, nickel, aluminum, nitrogen, copper, molybdenum, titanium, vanadium, niobium, and boron disclosed by Hoshino et al. ('955) overlap the composition of the instant invention, which is a prima facie case of obviousness. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the

time the invention was made to select the claimed composition over the composition disclosed by Hoshino et al. ('955) because Hoshino et al. ('955) disclose the same utility throughout the disclosed ranges.

With respect to the martensitic stainless steel having "a plastically-processed history" in claims 7-8, Hoshino et al. ('955) disclose wherein the martensitic stainless steel would be cold rolled (col. 2, lines 32-68).

With respect to the limitation wherein the hardness would be 30-45 HRC in claims 7-8, Hoshino et al. ('955) disclose hardnesses that would be in the range of 30-45 HRC (Fig. 2).

With respect to the limitation that the amount of carbides in the grain boundaries of the prior austenite would not be more than 0.5 volume percent in claims 7-8, Hoshino et al. ('955) disclose an overlapping composition and a substantially similar treatment process (col. 6). Therefore, the amount of carbides in the grain boundaries of the prior austenite being not more than 0.5 volume percent would be expected. See MPEP 2112.01 I.

With respect to the formula $0.2 \leq \text{Mo} + \text{Cu}/4 \leq 5$ and $0.55 \leq \text{Mo} + \text{Cu}/4 \leq 5$ in claims 7-8, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, *In re Cooper and Foley* 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, *Taklatwalla v. Marburg*, 620 O.G. 685, 1949 C.D. 77, and *In re Pilling*, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. *In re*

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Austin, et al., 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of copper and molybdenum from the ranges disclosed by Hoshino et al. ('955) such that the formula would be satisfied because Hoshino et al. ('955) teaches the same utility throughout the disclosed ranges.

Claims 13-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoshino et al. (US 4,878,955) in view of Kushida et al. (US 6,379,621).

In regards to claims 13-14, Hoshino et al. ('955) disclose a martensitic stainless steel, with a composition that compares with the composition of the instant invention, as shown in the table below (col. 2, lines 32-68).

Element	From Instant Claims (mass percent)	Hoshino et al. ('955) (mass percent)	Overlapping range
C	0.02 – 0.10	0 – 0.10	0.02 – 0.10
Si	0.05 – 1.0	0.85 – 4.5	0.85 – 1.0
Mn	0.05 – 0.95	0.20 – 5.0	0.05 – 0.95
P	0 – 0.03	0 – 0.06	0 – 0.03
S	0 – 0.01	0 – 0.03	0 – 0.01
Cr	9.0 – 15.0	10.0 – 17.0	10.0 – 15.0
Ni	0.1 – 4.5	3.0 – 8.0	3.0 – 4.5
Al	0 – 0.05	0 – 1.0	0 – 0.05
N	0 – 0.10	0 – 0.10	0 – 0.10
Cu	0.05 – 5.0	0 – 4.0	0.05 – 4.0
Mo	0.05 – 5.0	0 – 4.0	optional
Fe	balance	balance	balance

The Examiner notes that the amounts of carbon, silicon, manganese, phosphorus, sulfur, chromium, nickel, aluminum, nitrogen, copper, and molybdenum disclosed by Hoshino et al. ('955) overlap the composition of the instant invention, which is a prima facie case of obviousness. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the

claimed composition over the composition disclosed by Hoshino et al. ('955) because Hoshino et al. ('955) disclose the same utility throughout the disclosed ranges.

With respect to the martensitic stainless steel having "a plastically-processed history" in claims 13-14, Hoshino et al. ('955) disclose wherein the martensitic stainless steel would be cold rolled (col. 2, lines 32-68).

With respect to the limitation wherein the hardness would be 30-45 HRC in claims 13-14, Hoshino et al. ('955) disclose hardnesses that would be in the range of 30-45 HRC (Fig. 2).

With respect to the limitation that the amount of carbides in the grain boundaries of the prior austenite would not be more than 0.5 volume percent in claims 13-14, Hoshino et al. ('955) disclose an overlapping composition and a substantially similar treatment process (col. 6). Therefore, the amount of carbides in the grain boundaries of the prior austenite being not more than 0.5 volume percent would be expected. See MPEP 2112.01 I.

With respect to the formula $0.2 \leq \text{Mo} + \text{Cu}/4 \leq 5$ and $0.55 \leq \text{Mo} + \text{Cu}/4 \leq 5$ in claims 13-14, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, *In re Cooper and Foley* 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, *Taklatwalla v. Marburg*, 620 O.G. 685, 1949 C.D. 77, and *In re Pilling*, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. *In re Austin, et al.*, 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in

the art to select the desired amounts of copper and molybdenum from the ranges disclosed by Hoshino et al. ('955) such that the formula would be satisfied because Hoshino et al. ('955) teaches the same utility throughout the disclosed ranges.

Still regarding claims 13-14, the Examiner notes that the recitation "the martensitic stainless steel having a structure resulting from one of quenching, air cooling, quenching followed by a 400°C or lower tempering treatment or air cooling followed by a 400°C or lower tempering treatment are process limitations, yet the claims are drawn to a product. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. In re Thorpe, 777F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP 2113.

Still regarding claims 13-14, Hoshino et al. ('955) disclose a martensitic stainless steel as shown above and welding plates of the martensitic stainless steel (col. 8, lines 13-21), but Hoshino et al. ('955) do not specify wherein the amounts of copper and molybdenum would be an effective amount to form a sulfide layer on a formed chromium oxide layer, wherein the sulfide layer would be formed as a result of the martensitic stainless steel being subjected to a sulfur-containing environment.

Kushida et al. ('821) disclose a substantially similar martensitic stainless steel requiring at least 0.5 weight percent of copper and molybdenum to provide sour gas resistance when being exposed to a hydrogen sulfide containing fluid (col. 5 and col. 10, lines 38-63).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include at least 0.5 weight percent of copper and

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molybdenum when containing a hydrogen sulfide containing fluid, as disclosed by Kushida et al. ('821), in the martensitic stainless steel metal, as disclosed by Hoshino et al. ('955), in order to improve sour gas resistance, as disclosed by Kushida et al. ('821) (col. 10, lines 38-63).

Still regarding claims 13-14, the Examiner asserts that exposure to the hydrogen sulfide atmosphere would be a sulfur-containing environment and therefore a sulfide layer would inherently be formed.

In regards to claims 15-16, Hoshino et al. ('955) disclose a martensitic stainless steel, with a composition that compares with the composition of the instant invention, as shown in the table below (col. 2, lines 32-68).

Element	From Instant Claims (mass percent)	Hoshino et al. ('955) (mass percent)	Overlapping range
C	0.02 – 0.10	0 – 0.10	0.02 – 0.10
Si	0.05 – 1.0	0.85 – 4.5	0.85 – 1.0
Mn	0.05 – 0.95	0.20 – 5.0	0.05 – 0.95
P	0 – 0.03	0 – 0.06	0 – 0.03
S	0 – 0.01	0 – 0.03	0 – 0.01
Cr	9.0 – 15.0	10.0 – 17.0	10.0 – 15.0
Ni	0.1 – 4.5	3.0 – 8.0	3.0 – 4.5
Al	0 – 0.05	0 – 1.0	0 – 0.05
N	0 – 0.10	0 – 0.10	0 – 0.10
Cu	0.05 – 5.0	0 – 4.0	0.05 – 4.0
Mo	0.05 – 5.0	0 – 4.0	optional
Ti	0.005 – 0.5	0 – 1.0	0.005 – 0.5
V	0.005 – 0.5	0 – 1.0	0.005 – 0.5
Nb	0.005 – 0.5	0 – 1.0	0.005 – 0.5
Fe	balance	balance	balance

The Examiner notes that the amounts of carbon, silicon, manganese, phosphorus, sulfur, chromium, nickel, aluminum, nitrogen, copper, molybdenum, titanium, vanadium, and niobium disclosed by Hoshino et al. ('955) overlap the

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composition of the instant invention, which is a prima facie case of obviousness. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed composition over the composition disclosed by Hoshino et al. ('955) because Hoshino et al. ('955) disclose the same utility throughout the disclosed ranges.

With respect to the martensitic stainless steel having "a plastically-processed history" in claims 15-16, Hoshino et al. ('955) disclose wherein the martensitic stainless steel would be cold rolled (col. 2, lines 32-68).

With respect to the limitation wherein the hardness would be 30-45 HRC in claims 15-16, Hoshino et al. ('955) disclose hardnesses that would be in the range of 30-45 HRC (Fig. 2).

With respect to the limitation that the amount of carbides in the grain boundaries of the prior austenite would not be more than 0.5 volume percent in claims 15-16, Hoshino et al. ('955) disclose an overlapping composition and a substantially similar treatment process (col. 6). Therefore, the amount of carbides in the grain boundaries of the prior austenite being not more than 0.5 volume percent would be expected. See MPEP 2112.01 I.

With respect to the formula $0.2 \leq \text{Mo} + \text{Cu}/4 \leq 5$ and $0.55 \leq \text{Mo} + \text{Cu}/4 \leq 5$ in claims 15-16, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, In re Cooper and Foley 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, Taklatwalla v. Marburg, 620 O.G. 685, 1949 C.D. 77, and In re Pilling, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of

evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of copper and molybdenum from the ranges disclosed by Hoshino et al. ('955) such that the formula would be satisfied because Hoshino et al. ('955) teaches the same utility throughout the disclosed ranges.

Still regarding claims 15-16, the Examiner notes that the recitation "the martensitic stainless steel having a structure resulting from one of quenching, air cooling, quenching followed by a 400°C or lower tempering treatment or air cooling followed by a 400°C or lower tempering treatment are process limitations, yet the claims are drawn to a product. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. In re Thorpe, 777F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP 2113.

Still regarding claims 15-16, Hoshino et al. ('955) disclose a martensitic stainless steel as shown above and welding plates of the martensitic stainless steel (col. 8, lines 13-21), but Hoshino et al. ('955) do not specify wherein the amounts of copper and molybdenum would be an effective amount to form a sulfide layer on a formed chromium oxide layer, wherein the sulfide layer would be formed as a result of the martensitic stainless steel being subjected to a sulfur-containing environment.

Kushida et al. ('821) disclose a substantially similar martensitic stainless steel requiring at least 0.5 weight percent of copper and molybdenum to provide sour gas resistance when being exposed to a hydrogen sulfide containing fluid (col. 5 and col. 10,

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lines 38-63).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include at least 0.5 weight percent of copper and molybdenum when containing a hydrogen sulfide containing fluid, as disclosed by Kushida et al. ('821), in the martensitic stainless steel metal, as disclosed by Hoshino et al. ('955), in order to improve sour gas resistance, as disclosed by Kushida et al. ('821) (col. 10, lines 38-63).

Still regarding claims 15-16, the Examiner asserts that exposure to the hydrogen sulfide atmosphere would be a sulfur-containing environment and therefore a sulfide layer would inherently be formed.

In regards to claims 17-18, Hoshino et al. ('955) disclose a martensitic stainless steel, with a composition that compares with the composition of the instant invention, as shown in the table below (col. 2, lines 32-68).

Element	From Instant Claims (mass percent)	Hoshino et al. ('955) (mass percent)	Overlapping range
C	0.02 – 0.10	0 – 0.10	0.02 – 0.10
Si	0.05 – 1.0	0.85 – 4.5	0.85 – 1.0
Mn	0.05 – 0.95	0.20 – 5.0	0.05 – 0.95
P	0 – 0.03	0 – 0.06	0 – 0.03
S	0 – 0.01	0 – 0.03	0 – 0.01
Cr	9.0 – 15.0	10.0 – 17.0	10.0 – 15.0
Ni	0.1 – 4.5	3.0 – 8.0	3.0 – 4.5
Al	0 – 0.05	0 – 1.0	0 – 0.05
N	0 – 0.10	0 – 0.10	0 – 0.10
Cu	0.05 – 5.0	0 – 4.0	0.05 – 4.0
Mo	0.05 – 5.0	0 – 4.0	optional
B	0.0002 – 0.005	0 – 1.0	0.0002 – 0.005
Fe	balance	balance	balance

The Examiner notes that the amounts of carbon, silicon, manganese, phosphorus, sulfur, chromium, nickel, aluminum, nitrogen, copper, molybdenum, and boron disclosed by Hoshino et al. ('955) overlap the composition of the instant invention, which is a prima facie case of obviousness. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed composition over the composition disclosed by Hoshino et al. ('955) because Hoshino et al. ('955) disclose the same utility throughout the disclosed ranges.

With respect to the martensitic stainless steel having "a plastically-processed history" in claims 17-18, Hoshino et al. ('955) disclose wherein the martensitic stainless steel would be cold rolled (col. 2, lines 32-68).

With respect to the limitation wherein the hardness would be 30-45 HRC in claims 17-18, Hoshino et al. ('955) disclose hardnesses that would be in the range of 30-45 HRC (Fig. 2).

With respect to the limitation that the amount of carbides in the grain boundaries of the prior austenite would not be more than 0.5 volume percent in claims 17-18, Hoshino et al. ('955) disclose an overlapping composition and a substantially similar treatment process (col. 6). Therefore, the amount of carbides in the grain boundaries of the prior austenite being not more than 0.5 volume percent would be expected. See MPEP 2112.01 I.

With respect to the formula $0.2 \leq \text{Mo} + \text{Cu}/4 \leq 5$ and $0.55 \leq \text{Mo} + \text{Cu}/4 \leq 5$ in claims 13-14, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, In re Cooper and Foley 1943

C.D. 357, 553 O.G. 177; 57 USPQ 117, Taklatwalla v. Marburg, 620 O.G. 685, 1949 C.D. 77, and In re Pilling, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of copper and molybdenum from the ranges disclosed by Hoshino et al. ('955) such that the formula would be satisfied because Hoshino et al. ('955) teaches the same utility throughout the disclosed ranges.

Still regarding claims 17-18, the Examiner notes that the recitation "the martensitic stainless steel having a structure resulting from one of quenching, air cooling, quenching followed by a 400°C or lower tempering treatment or air cooling followed by a 400°C or lower tempering treatment are process limitations, yet the claims are drawn to a product. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. In re Thorpe, 777F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP 2113.

Still regarding claims 17-18, Hoshino et al. ('955) disclose a martensitic stainless steel as shown above and welding plates of the martensitic stainless steel (col. 8, lines 13-21), but Hoshino et al. ('955) do not specify wherein the amounts of copper and molybdenum would be an effective amount to form a sulfide layer on a formed chromium oxide layer, wherein the sulfide layer would be formed as a result of the martensitic stainless steel being subjected to a sulfur-containing environment.

Kushida et al. ('821) disclose a substantially similar martensitic stainless steel

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requiring at least 0.5 weight percent of copper and molybdenum to provide sour gas resistance when being exposed to a hydrogen sulfide containing fluid (col. 5 and col. 10, lines 38-63).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include at least 0.5 weight percent of copper and molybdenum when containing a hydrogen sulfide containing fluid, as disclosed by Kushida et al. ('821), in the martensitic stainless steel metal, as disclosed by Hoshino et al. ('955), in order to improve sour gas resistance, as disclosed by Kushida et al. ('821) (col. 10, lines 38-63).

Still regarding claims 17-18, the Examiner asserts that exposure to the hydrogen sulfide atmosphere would be a sulfur-containing environment and therefore a sulfide layer would inherently be formed.

In regards to claims 19-20, Hoshino et al. ('955) disclose a martensitic stainless steel, with a composition that compares with the composition of the instant invention, as shown in the table below (col. 2, lines 32-68).

Element	From Instant Claims (mass percent)	Hoshino et al. ('955) (mass percent)	Overlapping range
C	0.02 – 0.10	0 – 0.10	0.02 – 0.10
Si	0.05 – 1.0	0.85 – 4.5	0.85 – 1.0
Mn	0.05 – 0.95	0.20 – 5.0	0.05 – 0.95
P	0 – 0.03	0 – 0.06	0 – 0.03
S	0 – 0.01	0 – 0.03	0 – 0.01
Cr	9.0 – 15.0	10.0 – 17.0	10.0 – 15.0
Ni	0.1 – 4.5	3.0 – 8.0	3.0 – 4.5
Al	0 – 0.05	0 – 1.0	0 – 0.05
N	0 – 0.10	0 – 0.10	0 – 0.10
Cu	0.05 – 5.0	0 – 4.0	0.05 – 4.0
Mo	0.05 – 5.0	0 – 4.0	optional
Ti	0.005 – 0.5	0 – 1.0	0.005 – 0.5

Element	From Instant Claims (mass percent)	Hoshino et al. ('955) (mass percent)	Overlapping range
V	0.005 – 0.5	0 – 1.0	0.005 – 0.5
Nb	0.005 – 0.5	0 – 1.0	0.005 – 0.5
B	0.0002 – 0.005	0 – 1.0	0.0002 – 0.005
Fe	balance	balance	balance

The Examiner notes that the amounts of carbon, silicon, manganese, phosphorus, sulfur, chromium, nickel, aluminum, nitrogen, copper, molybdenum, titanium, vanadium, niobium and boron disclosed by Hoshino et al. ('955) overlap the composition of the instant invention, which is a prima facie case of obviousness. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed composition over the composition disclosed by Hoshino et al. ('955) because Hoshino et al. ('955) disclose the same utility throughout the disclosed ranges.

With respect to the martensitic stainless steel having "a plastically-processed history" in claims 19-20, Hoshino et al. ('955) disclose wherein the martensitic stainless steel would be cold rolled (col. 2, lines 32-68).

With respect to the limitation wherein the hardness would be 30-45 HRC in claims 17-18, Hoshino et al. ('955) disclose hardnesses that would be in the range of 30-45 HRC (Fig. 2).

With respect to the limitation that the amount of carbides in the grain boundaries of the prior austenite would not be more than 0.5 volume percent in claims 19-20, Hoshino et al. ('955) disclose an overlapping composition and a substantially similar treatment process (col. 6). Therefore, the amount of carbides in the grain boundaries of

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the prior austenite being not more than 0.5 volume percent would be expected. See MPEP 2112.01 I.

With respect to the formula $0.2 \leq \text{Mo} + \text{Cu}/4 \leq 5$ and $0.55 \leq \text{Mo} + \text{Cu}/4 \leq 5$ in claims 19-20, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, *In re Cooper and Foley* 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, *Taklatwalla v. Marburg*, 620 O.G. 685, 1949 C.D. 77, and *In re Pilling*, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. *In re Austin, et al.*, 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of copper and molybdenum from the ranges disclosed by Hoshino et al. ('955) such that the formula would be satisfied because Hoshino et al. ('955) teaches the same utility throughout the disclosed ranges.

Still regarding claims 19-20, the Examiner notes that the recitation "the martensitic stainless steel having a structure resulting from one of quenching, air cooling, quenching followed by a 400°C or lower tempering treatment or air cooling followed by a 400°C or lower tempering treatment are process limitations, yet the claims are drawn to a product. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. *In re Thorpe*, 777F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP 2113.

Still regarding claims 19-20, Hoshino et al. ('955) disclose a martensitic stainless steel as shown above and welding plates of the martensitic stainless steel (col. 8, lines

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13-21), but Hoshino et al. ('955) do not specify wherein the amounts of copper and molybdenum would be an effective amount to form a sulfide layer on a formed chromium oxide layer, wherein the sulfide layer would be formed as a result of the martensitic stainless steel being subjected to a sulfur-containing environment.

Kushida et al. ('821) disclose a substantially similar martensitic stainless steel requiring at least 0.5 weight percent of copper and molybdenum to provide sour gas resistance when being exposed to a hydrogen sulfide containing fluid (col. 5 and col. 10, lines 38-63).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include at least 0.5 weight percent of copper and molybdenum when containing a hydrogen sulfide containing fluid, as disclosed by Kushida et al. ('821), in the martensitic stainless steel metal, as disclosed by Hoshino et al. ('955), in order to improve sour gas resistance, as disclosed by Kushida et al. ('821) (col. 10, lines 38-63).

Still regarding claims 19-20, the Examiner asserts that exposure to the hydrogen sulfide atmosphere would be a sulfur-containing environment and therefore a sulfide layer would inherently be formed.

Response to Arguments

Applicant's arguments with respect to claims 1-8 and 13-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessee Roe whose telephone number is (571) 272-5938. The examiner can normally be reached on Monday-Friday 7:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Roy V. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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